

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
21 September 2000 (21.09.2000)

PCT

(10) International Publication Number
WO 00/55286 A3

(51) International Patent Classification⁷: C11D 17/00, (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, 3/06, 3/43 AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(21) International Application Number: PCT/GB00/00945

(22) International Filing Date: 17 March 2000 (17.03.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

9906215.0 18 March 1999 (18.03.1999) GB
0004124.4 23 February 2000 (23.02.2000) GB

(71) Applicant and

(72) Inventor: MULLANE, Mark, Gary [GB/GB]; 10 South View, Portishead, North Somerset BS20 7DP (GB).

(74) Agent: COATES, Ian, Harold; Sommerville & Rushton, 45 Grosvenor Road, St Albans, Hertfordshire AL1 3AW (GB).

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

— With international search report.

(88) Date of publication of the international search report:
28 December 2000

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.



WO 00/55286 A3

(54) Title: CLEANING FORMULATION

(57) Abstract: An alkaline, aqueous composition suitable for cleaning carpets and other surfaces, which composition comprises: a) 0.1 to 50 % w/w of a first cleaning agent; b) 0.1 to 20 % w/w of a second cleaning agent; c) 0.1 to 10 % w/w of a third cleaning agent; and d) 0.1 to 10 % w/w of a surfactant and optionally minor amounts of additives, with the balance being made up of water. This formulation is preferably used in conjunction with a neutralising solution. A method for cleaning carpets and other surfaces is also disclosed.

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 C11D17/00 C11D3/06 C11D3/43

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 IPC 7 C11D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 86 04349 A (STALEY MFG CO A E) 31 July 1986 (1986-07-31) claims 1-4 page 2, line 24 -page 3, line 11 page 10, line 22 - line 29 ---	1-3,5,6, 9,10,17, 20
X	DE 40 39 348 A (HENKEL KGAA) 11 June 1992 (1992-06-11) claim 3 ---	1,2
X	US 4 257 908 A (WIXON HAROLD E) 24 March 1981 (1981-03-24) abstract; examples ---	1,2,5
A	US 5 192 461 A (CRAIN JAMES R ET AL) 9 March 1993 (1993-03-09) abstract -----	1

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *Z* document member of the same patent family

Date of the actual completion of the international search

21 August 2000

Date of mailing of the international search report

06.10.2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patenttaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl.
Fax: (+31-70) 340-3016

Authorized officer:

SEIRAFI

ANHANG

Zum internationalen Recherchenbericht über die internationale Patentanmeldung Nr.

ANNEX

To the International Search Report to the international Patent Application No.

ANNEXE

Au rapport de recherche international relativ à la demande de brevet international n°

PCT/GB 00/00945 SAE 281140

In diesem Anhang sind die Mitglieder der Patentfamilien der im obengenannten internationalen Recherchenbericht angeführten Patentdokumente angegeben. Diese Angaben dienen nur zur Unterrichtung und erfolgen ohne Gewähr.

This annex lists the patent family members relating to the patent documents cited in the above-mentioned search report. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

La présente annexe indique les membres de la famille de brevets relatifs aux documents de brevets cités dans le rapport de recherche international visée ci-dessus. Les renseignements fournis sont donnés à titre indicatif et n'engagent pas la responsabilité de l' Office.

Im Recherchenbericht angeführte Patentdokumente Patent document cited in search report Document de brevet cité dans le rapport de recherche		Datum der Veröffentlichung Publication date Date de publication	Mitglied(er) der Patentfamilie Patent family member(s) Membre(s) de la famille de brevets	Datum der Veröffentlichung Publication date Date de publication
WO	A1	8604349	31-07-1986	CA A1 1278971
			DE C0 3665734	15-01-1991
			EP A1 210220	26-10-1989
			EP B1 210220	04-02-1987
			JP T2 62501570	20-09-1989
			US A 4627931	25-06-1987
DE	A1	4039348	11-06-1992	AT E 144549
			CA AA 2098197	09-11-1996
			DE C0 59108308	10-06-1992
			DK T3 561842	28-11-1996
			EP A1 561842	24-03-1997
			EP B1 561842	29-09-1993
			ES T3 2094829	23-10-1996
			FI A 932601	01-02-1997
			FI A0 932601	07-06-1993
			GR T3 3021680	07-06-1993
			JP T2 6503371	28-02-1997
			NO A 931661	14-04-1994
			NO A0 931661	06-05-1993
			NO B1 302374	06-05-1993
			US A 5429684	23-02-1998
			WO A1 9210558	04-07-1995
US	A	4257908	24-03-1981	AU A1 16269/76
			AU B2 509049	25-06-1992
			CA A1 1070590	17-04-1980
US	A	5192461	09-03-1993	none

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
24 January 2002 (24.01.2002)

PCT

(10) International Publication Number
WO 02/06435 A1

(51) International Patent Classification⁷: **C11D 3/43,**
17/00, 3/20 (US). DE DOMINICIS, Mattia [IT/IT]; Via Saetta, 24 int.
29, I-35100 Padova (IT).

(21) International Application Number: PCT/GB01/03106 (74) Agents: BROWN, Andrew, Stephen et al.; Reckitt Benckiser plc, Group Patents Dept., Dansom Lane, Hull HU8 7DS (GB).

(22) International Filing Date: 11 July 2001 (11.07.2001)

(25) Filing Language: English (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(71) Applicant (*for all designated States except MN, US*): RECKITT BENCKISER INC. [US/US]; 1655 Valley Road, Wayne, NJ 07474 (US).

(71) Applicant (*for MN only*): RECKITT BENCKISER (UK) LIMITED [GB/GB]; 103-105 Bath Road, Slough, Berkshire SL1 3UH (GB).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): RYAN, Tracy, Ann [US/US]; 327 Cambridge Drive, Ramsey, NJ 07446 (US). ASHTON, Kelleigh, Ann [US/US]; 323 Route 32 South, New Paltz, NY 12561 (US). BELANSKY, Carol, Ann [US/US]; 292 W. Colfax Street, Roselle Park, NJ 07204

Published:
— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.



WO 02/06435 A1

(54) Title: CARPET CLEANERS

(57) Abstract: An improved quick breaking foam carpet cleaner is provided. Good cleaning is achieved and the foam breaks quickly, allowing for quicker cleaning and use of the carpet without the need for subsequent vacuuming.

CARPET CLEANERS

FIELD OF THE INVENTION

5 This invention relates to fabric cleaning compositions of the type adaptable for use in the cleaning of textile fabrics such as carpets, and more particularly to cleaning compositions for carpets that do not require rubbing, scrubbing, or vacuuming.

BACKGROUND OF THE INVENTION

10 Fabric cleaning formulations have been previously developed and employed in the cleaning of textile fabrics of the type normally found in carpets and rugs. Many of the prior fabric cleaning formulations involve the use of detergent materials in aqueous or solvent mediums, in which dirt and soil are removed by normal detergent action. Others 15 involve formulations which are applied dry or damp to the fabric surface. Soil and dirt particles are, in effect, loosened by mild detergent action. Loosened particles are then adsorbed on particles of filler material and thereafter vacuumed from the fabric.

20 A disadvantage to many of the previous cleaning formulations is that the cleaned area is wet or damp for a long period of time, making the carpeted area unusable. In addition, some carpet cleaners are of the foam type in which the foam will remain stable for a long period of time, for example 15 to 20 minutes, before it collapses. Thereafter, the carpet is allowed to dry, when dry it can be vacuumed and then used.

25 Thus, an object of the present invention is to provide a composition with a quick breaking foam or even a bubbling action that cleans a variety of stains without the need for subsequent vacuuming of the carpet. In so doing, the carpeted area that has been cleaned will be useable in a shorter period of time.

30

SUMMARY OF THE INVENTION

The present invention is directed to a foaming or bubbling composition for cleaning carpets which comprises a solvent system comprising one or more organic solvents; a surfactant selected from the group consisting of anionic surfactant, non-ionic surfactant, and mixtures thereof; a propellant; and water. The composition may also

5 contain an hydrotrope. The composition optionally contains one or more cationic surfactants, one or more corrosion inhibitors, pH buffering agents, perfumes, perfume carriers, pH adjusting agents, pH buffers, antioxidants, antimicrobials, germicides, fungicides, acaricides, allergen neutralizer and preservatives, wherein the foam breaks within ten minutes of application to the carpet.

10 The organic solvents can be selected from one or more of glycol ethers, m-Pyrol, low molecular weight alcohols, and mixtures thereof. Examples of glycol ethers include ethylene glycol monomethyl ether, ethylene glycol monobutyl ether, diethylene glycol monomethyl ether, diethylene glycol monobutyl ether, propylene glycol phenyl ether, propylene glycol monomethyl ether, dipropylene glycol methyl ether, propylene glycol monopropyl ether, dipropylene glycol monopropyl ether, propylene glycol monobutyl ether, dipropylene glycol monobutyl ether and ethylene glycol monohexyl ether. Examples of low molecular weight alcohols include methanol, ethanol, n-propanol, isopropanol, and the like. Preferably, the solvent system is selected from the group

15 consisting of propylene glycol monopropyl ether or a mixture of dipropylene glycol methyl ether and dipropylene glycol monobutyl ether.

20

The non-ionic surfactant is preferably a surfactant having a formula RO(CH₂CH₂O)_nH wherein R is a mixture of linear, even carbon-number hydrocarbon chains ranging from C₁₂H₂₅ to C₁₈H₃₃ and n represents the number of repeating units and is a number of from about 1 to about 12. Examples of other non-ionic surfactants include higher aliphatic primary alcohols containing about twelve to about 16 carbon atoms which are condensed with about three to thirteen moles of ethylene oxide.

30 Other examples of nonionic surfactants include primary alcohol ethoxylates (available under the Neodol tradename from Shell Co.), such as C₁₁ alkanol condensed with 9 moles of ethylene oxide (Neodol 1-9), C₁₂₋₁₃ alkanol condensed with 6.5 moles ethylene oxide (Neodol 23-6.5), C₁₂₋₁₃ alkanol with 9 moles of ethylene oxide (Neodol 23-9), C₁₂₋₁₅ alkanol condensed with 7 or 3 moles ethylene oxide (Neodol 25-7 or Neodol

25-3), C₁₄₋₁₅ alkanol condensed with 13 moles ethylene oxide (Neodol 45-13), C₈₋₁₁ linear ethoxylated alcohol, averaging 2.5 moles of ethylene oxide per mole of alcohol (Neodol 91-2.5), and the like.

5 Other examples of non-ionic surfactants suitable for use in the present invention include ethylene oxide condensate products of secondary aliphatic alcohols containing 11 to 18 carbon atoms in a straight or branched chain configuration condensed with 5 to 30 moles of ethylene oxide. Examples of commercially available nonionic detergents of the foregoing type are C₁₁₋₁₅ secondary alkanol condensed with either 9 moles of
10 ethylene oxide (Tergitol 15-S-9) or 12 moles of ethylene oxide (Tergitol 15-S-12) marketed by Union Carbide, a subsidiary of Dow Chemical.

15 Octylphenoxy polyethoxyethanol type non-ionic surfactants, for example, Triton X-100, as well as amine oxides can also be used as a non-ionic surfactant in the present invention.

20 Other examples of linear primary alcohol ethoxylates are available under the Tomadol tradename such as, for example, Tomadol 1-7, a C₁₁ linear primary alcohol ethoxylate with 7 moles EO; Tomadol 25-7, a C₁₂-C₁₅ linear primary alcohol ethoxylate with 7 moles EO; Tomadol 45-7, a C₁₄-C₁₅ linear primary alcohol ethoxylate with 7 moles EO; and Tomadol 91-6, a C₉-C₁₁ linear alcohol ethoxylate with 6 moles EO.

25 Anionic surfactants can also be used in the present invention. Suitable anionic surfactants include, for example, alcohol sulfates (e.g. alkali metal or ammonium salts of alcohol sulfates) and sulfonates, alcohol phosphates and phosphonates, alkyl sulfonates, ethoxylated alkyl sulfonates, alkylaryl sulfonates, C₁₀₋₁₆ alkyl benzene sulfonates, C₁₀₋₁₈ alkyl alkoxy carboxylates having 1 to 5 moles of ethylene oxide, and the C₁₀₋₁₈ sarcosinates.

30 The compositions of the present invention also contain propellants such as pressurized gases, including carbon dioxide, air, nitrogen, nitrous oxide, as well as others, for example, propane, butane, pentane, isobutane, isopentane, mixtures of hydrocarbon gases (such as, for example, A-46 and A-70 available from Phillips Petroleum, CAP 40 and CAP 48 available from Shell, BPAP 40 available from BP

Chemicals), dimethyl ether, and mixtures thereof. The amount of propellant used is generally between 2 and 20% w/w of the entire composition. More preferably between 3 and 10% w/w of the entire composition. Typically, 6% w/w propellant is used.

5 The foam composition of the present invention is designed so that it collapses, or breaks, within a short period of time, preferably less than ten minutes, more preferably less than five minutes, even more preferably less than one minute and most preferably less than thirty seconds. Alternatively the composition can give a bubbling action for a short period of time, preferably less than five minutes, more preferably less than one
10 minute even more preferably less than thirty seconds. The quick breaking of the foam or the bubbling action permits the spot to blotted up quickly, allowing the carpeted surface to be used in a shorter period of time over conventional foam-type carpet cleaners where the time for the foam to collapse is longer, making clean-up time longer.

15 The present invention also relates to a process for the removal of stains from carpets which comprises the step of applying an effective amount of the composition of the present invention to a carpet in need of such treatment.

DETAILED DESCRIPTION OF THE INVENTION

20 The present invention is directed to a foam composition for cleaning carpets which comprises a solvent system comprising one or more organic solvents; a surfactant selected from the group consisting of anionic surfactant, non-ionic surfactant, and mixtures thereof; a propellant; and water. The composition may also contain an
25 hydrotrope. The composition optionally contains one or more cationic surfactants, one or more corrosion inhibitors, pH buffering agents, perfumes, perfume carriers, pH adjusting agents, pH buffers, antioxidants, antimicrobials, germicides, fungicides, acaricides, allergen neutralizer and preservatives, wherein the foam breaks within ten minutes of application to the carpet.

30 The organic solvents can be selected from one or more of glycol ethers, m-Pyrol, low molecular weight alcohols, and mixtures thereof. Examples of glycol ethers include ethylene glycol monomethyl ether, ethylene glycol monobutyl ether, diethylene glycol monomethyl ether, diethylene glycol monobutyl ether, propylene glycol phenyl ether,

propylene glycol monomethyl ether, dipropylene glycol methyl ether, propylene glycol monopropyl ether, dipropylene glycol monopropyl ether, propylene glycol monobutyl ether, dipropylene glycol monobutyl ether and ethylene glycol monohexyl ether.

Examples of low molecular weight alcohols include methanol, ethanol, n-propanol, 5 isopropanol, and the like. Preferably, the solvent system is selected from the group consisting of propylene glycol monopropyl ether or a mixture of dipropylene glycol methyl ether and dipropylene glycol monobutyl ether.

The non-ionic surfactant is preferably a surfactant having a formula

10 RO(CH₂CH₂O)_nH wherein R is a mixture of linear, even carbon-number hydrocarbon chains ranging from C₁₂H₂₅ to C₁₆H₃₃ and n represents the number of repeating units and is a number of from about 1 to about 12. Surfactants of this formula are presently marketed under the Genapol®, available from Hoechst Celanese Corp., Charlotte, N.C., including the 26-L series of the general formula RO(CH₂CH₂O)_nH wherein R is a mixture 15 of linear, even carbon-number hydrocarbon chains ranging from C₁₂H₂₅ to C₁₆H₃₃ and n represents the number of repeating units and is a number of from 1 to about 12, such as 26-L-1, 26-L-1.6, 26-L-2, 26-L-3, 26-L-5, 26-L-45, 26-L-50, 26-L-60, 26-L-60N, 26-L-75, 26-L-80, 26-L-98N, and the 24-L series, derived from synthetic sources and typically contain about 55% C₁₂ and 45% C₁₄ alcohols, such as 24-L-3, 24-L-45, 24-L-50, 24-L- 20 60, 24-L-60N, 24-L-75, 24-L-92, and 24-L-98N, both of which are commercially available from Hoechst Celanese Corp. From product literature, the single number following the "L" corresponds to the average degree of ethoxylation (numbers between 1 and 5) and the two digit number following the letter "L" corresponds to the cloud point in °C of a 1.0 wt.% solution in water.

25

Examples of other non-ionic surfactants include higher aliphatic primary alcohols containing about twelve to about 16 carbon atoms which are condensed with about three to thirteen moles of ethylene oxide.

30 Amine oxides can also be used as the non-ionic surfactant of the present invention. Exemplary useful amine oxide compounds may be defined as one or more of the following of the four general classes:

(1) Alkyl di (lower alkyl) amine oxides in which the alkyl group has about 6-24, and preferably 8-18 carbon atoms, and can be straight or branched chain, saturated or unsaturated. The lower alkyl groups include between 1 and 7 carbon atoms, but preferably each include 1 - 3 carbon atoms. Examples include octyl dimethyl amine oxide, lauryl dimethyl amine oxide, myristyl dimethyl amine oxide, and those in which the alkyl group is a mixture of different amine oxides, such as dimethyl cocoamine oxide, dimethyl (hydrogenated tallow) amine oxide, and myristyl/palmityl dimethyl amine oxide;

(2) Alkyl di (hydroxy lower alkyl) amine oxides in which the alkyl group has about 6-22, and preferably 8-18 carbon atoms, and can be straight or branched chain, saturated or unsaturated. Examples include bis-(2-hydroxyethyl) cocoamine oxide, bis(2-hydroxyethyl) tallowamine oxide; and bis-(2-hydroxyethyl) stearylamine oxide;

(3) Alkylamidopropyl di(lower alkyl) amine oxides in which the alkyl group has about 10-20, and preferably 12-16 carbon atoms, and can be straight or branched chain, saturated or unsaturated. Examples include cocoamidopropyl dimethyl amine oxide and tallowamidopropyl dimethyl amine oxide; and

(4) Alkylmorpholine oxides in which the alkyl group has about 10-20, and preferably 12-16 carbon atoms, and can be straight or branched chain, saturated or unsaturated.

Other examples of nonionic surfactants include primary alcohol ethoxylates (available under the Neodol tradename from Shell Co.), such as C₁₁ alkanol condensed with 9 moles of ethylene oxide (Neodol 1-9), C₁₂₋₁₃ alkanol condensed with 6.5 moles ethylene oxide (Neodol 23-6.5), C₁₂₋₁₃ alkanol with 9 moles of ethylene oxide (Neodol 23-9), C₁₂₋₁₅ alkanol condensed with 7 or 3 moles ethylene oxide (Neodol 25-7 or Neodol 25-3), C₁₄₋₁₅ alkanol condensed with 13 moles ethylene oxide (Neodol 45-13), and the like.

30

Other examples of non-ionic surfactants suitable for use in the present invention include ethylene oxide condensate products of secondary aliphatic alcohols containing 11 to 18 carbon atoms in a straight or branched chain configuration condensed with 5 to 30 moles of ethylene oxide. Examples of commercially available nonionic detergents of

the foregoing type are C₁₁₋₁₅ secondary alkanol condensed with either 9 moles of ethylene oxide (Tergitol 15-S-9) or 12 moles of ethylene oxide (Tergitol 15-S-12) marketed by Union Carbide, a subsidiary of Dow Chemical.

5 Octylphenoxy polyethoxyethanol type non-ionic surfactants, for example, Triton X-100, from Rohm & Haas, are also useful in the present invention.

Anionic surfactants can also be used in the present invention. Suitable anionic surfactants include, for example, alcohol sulfates (e.g. alkali metal or ammonium salts of 10 alcohol sulfates) and sulfonates, alcohol phosphates and phosphonates, alkyl sulfonates, ethoxylated alkyl sulfonates, alkylaryl sulfonates, C₁₀₋₁₆ alkyl benzene sulfonates, C₁₀₋₁₈ alkyl alkoxy carboxylates having 1 to 5 moles of ethylene oxide, and the C₁₀₋₁₈ sarcosinates.

15 Preferably, the alkyl chain length of a chosen surfactant will range from about nine-eleven carbon atoms to about 16 carbon atoms.

In the present invention, the preferred non-ionic surfactants are found in the Examples. The amount of non-ionic surfactant present in the compositions ranges from 20 about 0.2 to about 0.5 wt.%, preferably from about 0.2 to about 0.4 wt% of the composition.

The compositions of the present invention also contain propellants such as pressurized gases, including carbon dioxide, air, nitrogen, nitrous oxide, as well as 25 others, for example, propane, butane, pentane, isobutane, isopentane, mixtures of hydrocarbon gases (such as, for example, A-46 and A-70 available from Phillips Petroleum, CAP 40 and CAP 48 available from Shell, BPAP 40 available from BP Chemicals), dimethyl ether, and mixtures thereof. The amount of propellant used is generally between 2 and 20% w/w of the entire composition. More preferably between 30 3 and 10% w/w of the entire composition. Typically, 6% w/w propellant is used.

The present invention also relates to a process for the removal of stains from carpets which comprises the step of applying an effective amount of the composition of the present invention to a carpet in need of such treatment.

The compositions are largely aqueous in nature, and comprise water. Water is added to order to provide to 100% by weight of the compositions of the invention. The water may be tap water, but is preferably distilled and is most preferably deionized

5 water. If the water is tap water, it is preferably substantially free of any undesirable impurities such as organics or inorganics, especially mineral salts which are present in hard water which may thus undesirably interfere with the operation of the constituents present in the aqueous compositions according to the invention.

10 The composition of the present invention may also contain one or more hydrotropes. Suitable hydrotropes are sodium cumene sulfonate (ELTESOL SC40 available from Albright & Wilson), sodium xylene sulfonate (ELTESOL SX40 available from Albright & Wilson), di-sodium mono- and di-alkyl disulfonate diphenyloxide (DOWFAX 3B2 available from Dow Chemicals), n-octane sodium sulfonate (BIOTERGE 15 PAS 7 S or 8 S available from Stepan).

The compositions of the present invention can optionally contain one or more cationic surfactants, one or more corrosion inhibitors, pH buffering agents, perfumes, perfume carriers, pH adjusting agents, pH buffers, antioxidants, antimicrobials,

20 germicides, fungicides, acaricides, allergen neutralizer and preservatives which, when present, should be present in minor amounts, preferably in total comprise less than about 5% by weight (on an active weight basis) of the compositions, and desirably less than about 3%wt. It is known that certain types of fragrances can have an effect on the speed in which the foam breaks, but even with fragrance in the composition, the foam 25 will still break within the range of ten minutes.

The foam composition of the present invention is designed so that it collapses, or breaks, within a short period of time, preferably less than ten minutes, more preferably less than five minutes, even more preferably less than one minute and most preferably

30 less than thirty seconds. Alternatively the composition can give a bubbling action for a short period of time, preferably less than five minutes, more preferably less than one minute even more preferably less than thirty seconds. The quick breaking of the foam or the bubbling action permits the spot to blotted up quickly, allowing the carpeted surface

to be used in a shorter period of time over conventional foam-type carpet cleaners where the time for the foam to collapse is longer, making clean-up time longer.

The foaming/bubbling composition is applied to the stained area on the carpet.

- 5 The instantaneous foam/bubble production causes the stain to be lifted to the surface of the carpet pile and then the foam collapses. The stain is brought to the surface of the carpet, making it easier to blot and remove. While not being limited to this theory, it is believed that part of the good cleaning seen with the compositions of the present invention is due forces generated by the quick collapse of the foam, which causes the
- 10 stains to lifted to the surface of the carpet.

The present invention also relates to a process for the removal of stains from carpets which comprises the step of applying an effective amount of the composition of the present invention to a carpet in need of such treatment.

15

The composition is typically prepared by mixing all the components together in a suitable container to form a concentrate, placing an amount of the concentrate in a suitable container useful to dispense aerosols, and then the propellant is added. For the examples below, a charge of the example formulation (equal to 94% of the finished

- 20 product) is placed in a suitable canister and charged with 6% propellant. Examples of compositions forming a part of the present invention are set forth below in Table 1 with the various components identified in Table 2.

Tabl 1

Components	Ex. 1	Ex. 2	Ex. 3	Ex. 4	Ex. 5	Ex. 6	Ex. 7
	%	%	%	%	%	%	%
DI Water	82.45	82.45	82.25	81.45	81.45	81.45	81.45
Dowanol DPnB	4.5	----	4.5	4.5	4.5	4.5	4.5
Dowanol DPM	12.5	--	12.5	12.5	12.5	12.5	12.5
Dowanol PnP	----	17	----	----	----	----	----
Dowanol EB	----	----	----	----	----	----	----
IPA	----	----	----	----	----	----	----
Genapol 26-L-60	--	0.2	----	----	0.2	----	0.2
Genapol 26-L-80	0.2	----	0.2	0.2	----	0.2	----
Syntran 1575	----	----	----	1	1	----	----
Syntran 1580	----	----	----	----	----	1	1
Triton X-100	----	----	----	----	----	----	----
Sodium Benzoate	0.3	0.3	----	0.3	0.3	0.3	0.3
Monacor BE	----	----	0.5	----	----	----	----
Sodium Nitrite	----	----	----	----	----	----	----
Ammonium Hydroxide	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Total	100						

5

Table 1 (cont'd)

Components	Ex. 8	Ex. 9	Ex. 10	Ex. 11	Ex. 12	Ex. 13	Ex. 14
	%	%	%	%	%	%	%
DI Water	79.75	79.35	82.55	81.65	81.65	82.55	78.55
Dowanol DPnB	----	----	4.5	4.5	----	----	4.5
Dowanol DPM	----	----	12.5	12.5	----	----	16.5
Dowanol PnP	----	----	----	----	17	17	----
Dowanol EB	15	15	----	----	----	----	----
IPA	5	5	----	----	----	----	----
Genapol 26-L-60	----	----	----	----	0.2	0.2	----
Genapol 26-L-80	----	----	0.2	0.2	----	----	0.2
Triton X-100	0.05	0.05	----	----	----	----	----
Sodium Benzoate	----	----	----	0.3	0.3	----	----
Monacor BE	----	0.5	----	0.8	0.8	----	----
Sodium Nitrite	0.1	----	0.2	----	----	0.2	0.2
Ammonium Hydroxide	0.1	0.1	0.05	0.05	0.05	0.05	0.05
Total	100						

Table 1 (cont'd)

	Ex. 15	Ex. 16	Ex. 17	Ex. 18	Ex. 19	Ex. 20	Ex. 21
Components	%	%	%	%	%	%	%
DI Water	77.65	77.65	81.65	82.2	82.2	82.2	82.2
Dowanol DPnB	4.5	3.5	-----	-----	-----	17	-----
Dowanol DPM	16.5	17.5	8.5	-----	-----	-----	-----
Dowanol PnP	-----	-----	8.5	-----	-----	-----	-----
Dowanol EB	-----	-----	-----	17	17	-----	-----
Dowanol PM	-----	-----	-----	-----	-----	-----	17
Genapol 26-L-60	-----	-----	0.2	0.2	0.2	0.2	0.2
Genapol 26-L-80	0.2	0.2	-----	-----	-----	-----	-----
Sodium Benzoate	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Monacor BE	0.8	0.8	0.8	-----	-----	-----	-----
Sodium Bicarbonate	-----	-----	-----	0.1	0.1	0.34	0.1
Fragrance	-----	-----	-----	0.2	0.2	0.2	0.2
Ammonium Hydroxide	0.05	0.05	0.05	-----	dropwise	dropwise	dropwise
Total	100	100	100	100	100	100.24	100

Table 1 (cont'd)

	Ex. 22	Ex. 23	Ex. 24	Ex. 25	Ex. 26	Ex. 27	Ex. 28
Components	%	%	%	%	%	%	%
DI Water	82.2	82.2	82.45	82.45	82.45	82.45	82.45
Dowanol DPnB	-----	-----	-----	-----	-----	4.5	4.5
Dowanol EB	-----	17	-----	-----	8.5	-----	-----
Dowanol PM	-----	-----	-----	-----	-----	-----	-----
Dowanol DB	17	-----	-----	-----	-----	-----	-----
Dowanol DPM	-----	-----	-----	-----	-----	12.5	12.5
m-Pyrol	-----	-----	17	15.5	8.5	-----	-----
Hexyl Cellosolve	-----	-----	-----	1.5	-----	-----	-----
Genapol 26-L-3	-----	0.2	-----	-----	-----	-----	-----
Genapol 26-L-60	0.2	-----	0.2	0.2	0.2	-----	-----
Neodol 91-2.5	-----	-----	-----	-----	-----	0.2	-----
Tergitol 15-S-9	-----	-----	-----	-----	-----	-----	0.2
Sodium Benzoate	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Sodium Bicarbonate	0.17	0.17	-----	-----	-----	-----	-----
Fragrance	0.2	0.2	-----	-----	-----	-----	-----
Ammonium Hydroxide	dropwise	dropwise	0.05	0.05	0.05	0.05	0.05
Total	100.07	100.07	100	100	100	100	100

Table 1 (cont'd)

	Ex. 29	Ex. 30	Ex. 31	Ex. 32	Ex. 33	Ex. 34	Ex. 35
Components	%	%	%	%	%	%	%
DI Water	77.45	80.15	77.15	77.25	78.73	79.98	81.1
Dowanol DPnB	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Dowanol DPM	12.5	12.5	12.5	12.5	12.5	12.5	12.5
Dowanol PnP							
Eltesol SC 40	5	2.2	5	5	2.5	1.25	
Dowfax 3B2							1.13
Genapol 26-L-60							
Genapol 26-L-80	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sodium Benzoate	0.3	0.3	0.6		0.6	0.6	0.3
Monacor BE				0.5	0.82	0.82	
Sodium Bicarbonate							0.17
Fragrance		0.1					0.1
Ammonium Hydroxide	0.05	0.05	0.05	0.05	0.15	0.15	
Total	100	100	100	100	100	100.24	100

Table 2

Component	Description of Component
DI Water	Deionized water
Dowanol DPnB	Dipropylene glycol n-butyl ether from Dow Chemical
Dowanol DPM	Dipropylene glycol methyl ether from Dow Chemical
Dowanol PnP	Propylene glycol n-propyl ether from Dow Chemical
Dowanol EB	Ethylene glycol n-butyl ether from Dow Chemical
Dowanol PM	Propylene glycol methyl ether from Dow Chemical
Dowanol DB	Diethylene glycol n-butyl ether from Dow Chemical
m-Pyrol	N-methyl-pyrrolidone from ISP
Hexyl Cellosolve	Ethylene glycol monohexyl ether from Dow Chemical
IPA	Isopropyl alcohol
Genapol 26-L-60	Primary alcohol ethoxylate from Hoechst Celanese
Genapol 26-L-80	Primary alcohol ethoxylate from Hoechst Celanese
Syntran 1575	Acrylic copolymer from Interpolymer Corporation
Syntran 1580	Carboxylated acrylic copolymer from Interpolymer Corporation
Neodol 91-2.5	C ₈₋₁₁ linear ethoxylated alcohol, averaging 2.5 moles of ethylene oxide per mole of alcohol from Shell Chemical
Tergitol 15-S-9	C ₁₁₋₁₅ secondary alkanol condensed with 9 moles of ethylene oxide from Union Carbide, a subsidiary of Dow Chemical
Monacor BE	Monoethanolamine borate/monoisopropanolamine borate mixture (100%) from Uniqema
Sodium Nitrite	Sodium nitrite
Sodium Bicarbonate	Sodium bicarbonate
Fragrance	Proprietary fragrance from various suppliers
Sodium Benzoate	Sodium benzoate
Eltesol SC 40	Sodium cumene sulphonate
Ammonium Hydroxide	Ammonium hydroxide

5

Certain compositions of Table 1 were evaluated in a cleaning test and were compared against a commercially available product "Spot Shot" which is advertised as an instant carpet cleaner ("Commercial Product"). The Commercial Product is believed to contain about 5% propellant, about 16 to 17% solvent (butyl cellosolve), about 0.8% 10 Monacor BE, about 0.26% sodium benzoate, about 0.15% nonyl phenol type non-ionic surfactant, the balance being water.

The cleaning test that was conducted consisted of five stains cleaned with three compositions and five repetitions of each stain for each composition. The five stains 15 tested were: Red Ink; Dirty Motor Oil; Red Wine; Spaghetti Sauce; and Coffee.

The compositions tested were Ex. 1; Ex. 2; and Commercial Product.

The test was conducted as follows:

5 6" x 6" swatches of carpet were stained with the appropriate amount of the appropriate product.

Red Ink – 2" x 2" X

Dirty Motor Oil – 0.5g

Red Wine – 1.5g

10 Spaghetti Sauce – 2.0g

Coffee – 1.5g

The stains were allowed to dry for 24 hrs. in the room temperature chamber.

Thereafter, approximately 9.5g of the appropriate composition were applied on each
15 swatch. Then, each swatch was blotted by hand twice for a count of ten. The swatches
were allowed to dry overnight in the room temp chamber. The swatches were visually
scored based on a scale from 0 – 100. 0 = no soil removal and 100 = complete soil
removal.

20 The results were as follows:

For Red Ink: Ex. 1 is statistically better than Ex. 2. Both examples were at parity
with the Commercial Product.

25 For Dirty Motor Oil: Ex. 1 and Ex. 2 were both at parity with the Commercial
Product..

For Red Wine: Ex. 1 was at parity with Ex. 2. Both examples were prototypes
were statistically better over the Commercial Product.

30 For Spaghetti Sauce: Ex. 1 and Ex. 2 were both at parity with the Commercial
Product.

For Coffee: Ex. 1 was at parity with Ex. 2 and the Commercial Product. The Commercial Product was statistically better than Ex. 2.

We claim:

1. A foaming or bubbling carpet cleaning composition comprising:
 - (a) a solvent system comprising one or more organic solvents;
 - 5 (b) a surfactant selected from the group consisting of anionic surfactants, non-ionic surfactants, and mixtures thereof;
 - (c) a propellant; and
 - (d) water,

the composition may also contain one or more hydrotropes,

10 the composition optionally contains one or more cationic surfactants, one or more corrosion inhibitors, pH buffering agents, perfumes, perfume carriers, pH adjusting agents, pH buffers, antioxidants, antimicrobials, germicides, fungicides, acaricides, allergen neutralizer and preservatives,

wherein the foam breaks within ten minutes of application to the carpet.
- 15 2. The composition of claim 1 wherein the solvent system (a) is selected from either a mixture of dipropylene glycol methyl ether and dipropylene glycol n-butyl ether or propylene glycol n-propyl ether.
- 20 3. The composition of claim 2 wherein the solvent system (a) is propylene glycol n-propyl ether.
4. The composition of claim 3 wherein the surfactant (b) is selected from non-ionic surfactants.
- 25 5. The composition of claim 4 wherein the non-ionic surfactants are selected from primary alcohol ethoxylates and secondary alcohol ethoxylates.
- 30 6. The composition of claim 5 wherein the non-ionic surfactant is a primary alcohol ethoxylate of formula RO(CH₂CH₂O)_nH wherein R is a mixture of linear, even carbon-number hydrocarbon chains ranging from C₁₂H₂₅ to C₁₆H₃₃ and n represents the number of repeating units and is a number of from about 1 to about 12.

7. The composition of claim 6 wherein the foam breaks within or the bubbling action lasts for at least five minutes of application to the carpet.
8. The composition of claim 7 wherein the foam breaks within or the bubbling action
5 lasts for at least one minute of application to the carpet.
9. The composition of claim 8 wherein the foam breaks within or the bubbling action
lasts for at least thirty seconds of application to the carpet.
- 10 10: The composition of claim 9 wherein the foam breaks within or the bubbling action
lasts for at least fifteen seconds of application to the carpet.
11. The composition of claim 2 wherein the solvent system (a) is a mixture of
dipropylene glycol methyl ether and dipropylene glycol n-butyl ether.
- 15 12. The composition of claim 11 wherein the surfactant (b) is selected from non-ionic
surfactants.
13. The composition of claim 12 wherein the non-ionic surfactants are selected from
20 primary alcohol ethoxylates and secondary alcohol ethoxylates.
14. The composition of claim 13 wherein the non-ionic surfactant is a primary alcohol
ethoxyxlate of formula $RO(CH_2CH_2O)_nH$ wherein R is a mixture of linear, even carbon-
number hydrocarbon chains ranging from $C_{12}H_{25}$ to $C_{16}H_{33}$ and n represents the number
25 of repeating units and is a number of from about 1 to about 12.
15. The composition of claim 1 to 14 wherein the hydrotrope is selected from sodium
cumene sulfonate, sodium xylene sulfonate, di-sodium mono- and di-alkyl disulfonate
diphenyloxide, n-octane sodium sulfonate.
- 30 16. The composition of claim 15 wherein the hydrotrope is sodium cumene sulfonate.
17. The composition of claim 11 to 16 wherein the foam breaks within or the bubbling
action lasts for at least five minutes of application to the carpet.

18. The composition of claim 17 wherein the foam breaks within or the bubbling action lasts for at least one minute of application to the carpet.
- 5 19. The composition of claim 18 wherein the foam breaks within or the bubbling action lasts for at least thirty seconds of application to the carpet.
20. The composition of claim 19 wherein the foam breaks within or the bubbling action lasts for at least 15 seconds of application to the carpet.
- 10 21. A process for the removal of stains from carpeting which comprises the step of applying an effective amount of the composition according to claim 1 to a carpet needing such treatment.

INTERNATIONAL SEARCH REPORT

Int. onal Application No
PCT/GB 01/03106

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C11D3/43 C11D17/00 C11D3/20

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C11D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 652 389 A (MOLL KARL) 24 March 1987 (1987-03-24) claim 1; examples; table IV ---	1,7-10, 21
X	WO 98 04666 A (CLOROX CO) 5 February 1998 (1998-02-05) page 1, line 25 -page 2, line 2 page 3, line 5 - line 9; claims ---	1,2,7,21
A	WO 89 12673 A (VAX APPLIANCES LTD) 28 December 1989 (1989-12-28) claims; examples ---	1,4-6, 15,21
A	US 5 925 608 A (VOS EDDY ET AL) 20 July 1999 (1999-07-20) claims -----	1,4-6

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the International filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the International filing date but later than the priority date claimed

- *T* later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the International search

26 September 2001

Date of mailing of the International search report

08/10/2001

Name and mailing address of the ISA
European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Grittern, A

INTERNATIONAL SEARCH REPORT

Information on patent family members

Int'l. Appl. No.

PCT/GB 01/03106

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
US 4652389	A	24-03-1987	CA CA EP ES ES ES ES	1259880 A1 1312253 A2 0187004 A2 550881 D0 8703553 A1 550882 D0 8705514 A1 4780100 A		26-09-1989 05-01-1993 09-07-1986 16-02-1987 01-05-1987 16-05-1987 16-07-1987 25-10-1988
WO 9804666	A	05-02-1998	AU CA WO	3393797 A 2260921 A1 9804666 A1		20-02-1998 05-02-1998 05-02-1998
WO 8912673	A	28-12-1989	AU CN DK EP WO GB JP	3846689 A 1039614 A 44790 A 0379544 A1 8912673 A1 2229446 A 3501271 T		12-01-1990 14-02-1990 20-02-1990 01-08-1990 28-12-1989 26-09-1990 22-03-1991
US 5925608	A	20-07-1999	EP BR BR CA EP JP JP WO WO US ZA	0753556 A1 9609789 A 9609790 A 2226667 A1 0753561 A1 11508955 T 11508862 T 9703180 A1 9702999 A1 6021926 A 9605642 A		15-01-1997 16-03-1999 04-05-1999 30-01-1997 15-01-1997 03-08-1999 03-08-1999 30-01-1997 30-01-1997 08-02-2000 24-01-1997